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Mythology of Capital, or Misuse of Abstraction in Economics: Reconsidering the First Capital Controversy

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The first capital controversy between John Bates Clark and Eugene von Böhm-Bawerk starts off from and ends up with a fundamental disagreement over Clark's conception of true capital. In light of the philosophy of abstraction, this paper argues that the crux of the disagreement is to be found in the conflict between two contrasted views of Aristotelian non-precisive abstraction and Platonic precisive abstraction. The lessons to be learned from the first capital controversy are not only the mythology of Platonic precisive abstraction in Clark's theory, but more crucially the meaning of defending genuine realism in analysing the economy.

JEL Codes: B13; B40; B41; D24; P12

> He [Clark] has ingenuity and a perverse sort of originality, but he has no power of sustained reasoning and no sober sense of the realities of life. Most of Böhm-Bawerk's criticism of him in our Journal seems to me just.
> (Taussig, letter to Marshall in October 14, 1907; Whitaker 1996, 175)

Overview

The first capital controversy between John Bates Clark and Eugene von Böhm-Bawerk is one of the three capital controversies that have marked the history of capital theory.[1] The controversy roughly starts from the year of 1893 with Clark's attack on Böhm-Bawerk's published works on capital and interest. The subsequent years witness a mutual exchange of ideas in the *Quarterly Journal of Economics*, leaving however the key differences between two disputants unresolved. Debate restarts in 1906 after the publication of Böhm-Bawerk's delayed response to Clark's *The Distribution of Wealth*. Like the first round of debate, however, no resolution of disagreements is reached.[2]

Both disputants believe that the old conception of capital, which refers simultaneously to tools of production *and* the source of interest, is unqualified for studying material production and the determination of capitalist interest. However, their views diverge on what should be qualified as the correct conceptions of capital. Böhm-Bawerk proposes in place of the old conception dual conceptions of *acquisitive capital* and *social capital*, whereas Clark insists upon the conceptions of *true capital* and *capital goods*. The crux of the debate revolves around Clark's conception of true capital. While Clark insists that "our necessary way of viewing capital is as a fund" and it is necessary to thoroughly analyse "the action of this fund as an element in production and distribution" (Tanaka 2000, 131), Böhm-Bawerk (1907, 282) finds Clark's view untenable: "I must oppose his doctrines with all possible emphasis, in order to defend a solid and natural theory of capital against a mythology of capital."

As compared to the other two capital controversies, the first capital controversy so far has received only passing mention from scholars. One exception is Avi Cohen. In a detailed exposition of the first capital controversy, Cohen (2008) argues that the fundamental disagreement over Clark's conception of true capital concerns the use of static equilibrium and comparative statics in economics. Böhm-Bawerk's objection to Clark's capital theory, Cohen concludes, should be interpreted as an objection to *the mythology of static equilibrium*.

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[1] The other two capital controversies are: 1) Hayek/Knight controversy in the 1920's and 1930's; 2) Cambridge controversy in the mid-1950s and mid-1970s. See Solow (1963, 9).

[2] See Cohen and Drost (1996) for a chronology of the debate.

Cohen's systematic study falls short in one crucial respect. That is, it may suggest that the use of static equilibrium and comparative statics must be strictly ruled out as they are radically incompatible with a realistic analysis of the economy. Such a view is not only methodologically unconvincing (Mises [1949] 1995, 246–247; Long 2006), it is also problematic as the lesson that should be drawn from Clark's mythology of capital. Cohen's conclusion is the result of his unique perspective of understanding the first capital controversy. Not only is Clark's conception of true capital objectionable as a mythology of static equilibrium in light of the criticisms of Böhm-Bawerk, Böhm-Bawerk too is trapped into the same mythology in his analysis of the actual decision of the market rate of interest (Cohen 2008, 165–167). Granted that both Clark and Böhm-Bawerk have used statics in a theoretically unjustified manner,[3] still it is some distance from concluding that the use of statics is irreconcilable with a realistic approach to economics.

This paper proposes a new perspective to examine the first capital controversy. Inspired by insights from the philosophy of abstraction, it will be argued that the disputants' fundamental disagreement over the conception of true capital stems from two sharply contrasted philosophical views of abstraction. One is *Aristotelian* non-precisive abstraction, and another is *Platonic precisive abstraction*. Section two supplements the rest of this paper with a necessary sketch and comparison of the two views of abstraction. The central philosophical insight arrived at in this section is that, thought process involving Platonic precisive abstraction misleads one to understand real things to be otherwise than they actually are.

Of all the comments or studies on the first capital controversy, few has drawn attention to Böhm-Bawerk's dual conceptions of acquisitive and social capital. A common interpretation of Böhm-Bawerk holds that he is the leading proponent of materialism in capital theories, viz., he takes capital as nothing more than physical tools or weapons. In light of the philosophy of abstraction, section three provides the first systematic clarification of Böhm-Bawerk's dual conceptions of capital and argues that they should be understood as the products of Aristotelian non-precisive abstraction. Based on this original finding, section four further rejects the standard materialist interpretation in defense of the Aristotelian, realist reading of Böhm-Bawerk. It will be shown that the confusions on the part of Carl Menger, Frank Fetter, Ludwig von

[3] The equilibrium relationships implied by Böhm-Bawerk's theory of the market rate of interest (Böhm-Bawerk [1891] 1930, 375–424) can be formalized by a mathematical model determining simultaneously the equilibrium wage rate, the equilibrium interest rate and the optimal length of average period of production, given the supply of labor and means of subsistence (Blaug 1997, 488–494). For criticisms of Böhm-Bawerk's equilibrium analysis, see Lewin (2011, 75–77) and Garrison (1990).

Mises and their Austrian followers lead them to unjustifiably discredit Böhm-Bawerk as being radically opposed to their financial or accounting view of capital.

Section five and six deals with Clark's mythology of true capital. In section five, Clark's conceptions of capital goods and true capital are shown to be the products of Platonic precisive abstraction. Section six will show how Clark's extended discussions about material production and capitalist interest are distorted by his conception of true capital. But the point is not that the use of statics inevitably leads one to distort the reality. The point is that Clark's use of statics is ultimately grounded upon a view of abstraction that leads him to a distortion of reality.

The final section concludes with some overall reflections over the first capital controversy. The general lesson to be learned is that the use of static equilibrium and comparative statics in economics must be consonant with Aristotelian non-precisive abstraction. Nonetheless, it is a valid lesson only *on condition that the aim of economics is to illuminate the truths of reality*. Not all economists share with Böhm-Bawerk and Clark the same concern for truth criterion in judging the soundness of economic theories. Although it is beyond the scope of this paper to address the empiricist-positivist methodology of the mainstream economics, a complete understanding of the lesson drawn from the first capital controversy must eventually be situated into the broader context of defending genuine realism against the prevailing positivism in modern economics.

On Theories of Abstraction

It is neither possible nor necessary to address all the proposed philosophical theories of abstraction in this paper. For the argumentative purpose, suffice it to point out that there are basically two views of abstraction. One is *Platonic, precisive abstraction*, and another is *Aristotelian, non-precisive abstraction*. To quote the medieval Aristotelian philosopher Tomas Aquinas:

> Abstraction may occur in two ways: First, by way of composition and division; thus we may understand that one thing does not exist in some other, or that it is separate therefrom. Secondly, by way of simple and absolute consideration; thus we understand one thing without considering the other.
> (*Summa Theologiæ* I. 85. 1 ad 1)

With regard to abstraction in Aristotelian tradition, it is mostly used in the sense of "*selective attention*",[4] which "consists in focussing on an aspect, typically a general one,

[4] Bäck (2014, 5) mentions other senses of abstraction used occasionally by Aristotle.

and then looking for features that 'filter through' so as to agree with it, while ignoring the rest" (Bäck 2014, 5). Thus, when we make abstraction of things existing in reality, only some forms[5] of the things are specified in our thoughts, while the other forms, though they must be there and inseparably constitute the concrete things in reality, are "*absent from specification*" (Long 2006).

For example, when abstracting from a particular horse the abstract universal "horse", we are not denying the facts that there must be some other determinate forms that inseparably constitute that particular horse, for example, the horse is brown, is 500 kg, is running in Sapporo Racecourse … etc. *We are merely not specifying or expressing those facts*. To phrase it somewhat differently, while in this example it is only the abstract universal "horse"—the essence of that particular horse—that is specified in our thoughts, the essence still exists within this particular horse,[6] and the other unspecified aspects remain bound up with this individual horse and are ontologically inseparable therefrom. The concept horse then follows as referring to or corresponding to this particular horse we observe in reality.[7]

Perhaps it is best to understand Aristotelian abstraction as selective attention by quoting Aristotle himself:

> The same affection is involved in thinking as in drawing a diagram…although we make no use of the fact that the magnitude of a triangle is a finite quantity, yet we draw it as having a finite magnitude. In the same way the man who is thinking, though he may not be thinking of a finite magnitude, still puts a finite magnitude before his eyes, though he does not think of it as such. And even if the nature of the object is quantitative, but indeterminate, he still puts before him a finite magnitude, although he thinks of it as merely quantitative.
> (*On Memory and Recollection* 450a1–7)

Despite that an actual triangle must have a finite magnitude, we can still focus on its triangular essence and ignore the necessary concretization of such a triangular essence

[5] See Veatch (1974, 32) on forms as determinations of things: "The fact that a thing is this rather than that, that it is blue rather than orange, or that it is here rather than there, or that it is a dog rather than a cat—all of these possible determinations of things are so in virtue of what Aristotle calls forms." Veatch here is actually talking about both the substantial forms (that by virtue of which a thing is a dog rather than cat) and the accidental forms (that by virtue of which a thing is blue rather than orange).

[6] On the immanence of essence, see Oderberg (2007, 81–85).

[7] It might be tempted to differentiate between the *abstract objects* resulted from abstraction and *words* or *concepts*. Nevertheless, "Aristotle wants in his scientific language an isomorphism between the words and the objects" (Bäck 2014, 13). Thus, given the isomorphism between the concept horse and the abstract universal "horse" and moreover the immanence of essence, the concept must intend or refer to *any* individual horses existing in reality.

in *this particular triangle with a finite magnitude*, or we can focus our thoughts to one essential accident that flows from such an essence, viz., the quantitative nature, and ignore the fact that quantity, as an accidental form, must present itself in mind-independent reality as *a certain finite magnitude of the particular triangle*. Aristotelian abstraction as selective attention therefore is non-precisive. That is, we think of real particular things *in an indeterminate manner*.[8]

Thus, in sharp contrast to abstraction as understood by empiricists like Locke, Barkeley, and Hume, for whom it is purely a mental/epistemological process that generates concepts that need not at all reflect reality (Bäck 2014, 5; 11; 20), Aristotelian abstraction as selective attention is *both* an epistemological process whereby human beings locate the abstract universals as the proper subjects of sciences *and* an ontological process through which the abstract universals come to be grasped from the individual things we actually perceive in reality.[9] On the other hand, for Aristotelians, "No thing is universal" (Brentano 1981, 25), and the beings of *particulars* alone stand as the ultimate given for the working of abstraction: "Not only does all knowledge begin with the senses, but all immediate sensory perception is of particulars. It is from the particulars that we advance, through a process of abstraction, to the knowledge of universals, of which we form abstract concepts" (Oderberg 2007, 24). Aristotelian abstraction as selective attention "is not supposed to create or presuppose new objects existing *in re* over and above the individual substances given in sense perception" (Bäck 2014, 10).

It is on this point that Aristotelian non-precisive abstraction contrasts sharply with Platonic precisive abstraction. This type of abstraction is accurately described as a process of "*paring away*" (Bäck 2014, 5). To illustrate how it works, let us start off from an actual right-angled triangle with a finite magnitude in the sand. By paring away all those specific aspects of the triangle, we finally get the immutable, imperishable, and the perfect, viz., *the triangularity*. We can do the same to any other particular triangles, which might be isosceles or scalene, big or small, in the sand or in the paper..., and only one perfect being, the triangularity, leaves. The triangularity produced by Platonic precisive abstraction thus is free from all the imperfections of the particular triangles we observe in reality, and as such constitutes the ultimate ground for the dependent and derivative beings of all those triangles (Veatch 1974, 134–135). The concept triangle then follows as corresponding to this idealized Form or Idea. All other specific aspects

[8] Brentano (1981, 25): "Whatever *is* is fully determinate...But a thing that is completely determinate may yet be thought of without its complete determination. In this way, several different things may correspond to the same idea...and that this concept is a universal concept."

[9] According to Bäck (2014, 2), perception and knowledge are types of abstraction in Aristotle's theory of abstraction.

that constitute the actual triangles, on the other hand, are "*specified as absent*" (Long 2006) and fail to be captured by the concept.

Platonic extreme realism has been harshly criticised by Aristotelian metaphysics (Veatch 1974, 134–146; Oderberg 2007, 81–85), and it is convincing that Aristotle may have developed his theory of abstraction originally in opposition to Platonism (Bäck 2014, 8). From the perspective of the philosophy of abstraction, the fallacy of Platonic extreme realism rests upon its confusion of the mode of beings of things with the mode of thoughts of things (Veatch 1954, 51). To be precisely, "To think a thing otherwise than it is" involves falsehood when a real particular thing is, as the result of abstraction, taken *to be* a universal, whereas no falsehood is involved if abstraction leads only to universals in thoughts, which clearly are not the same as the things *qua particulars* in mind-independent reality (Kenny 1989, 134).[10] In sharp contrast to Platonic precisive abstraction, nowhere is it to be found from the Aristotelian process of derivation of the abstract universals that real individual things are followingly thought of as *being* otherwise than they actually are.

It has been outlined the contrast between Aristotelian non-precisive abstraction and Platonic precisive abstraction as well as the critiques of the latter. In the next section, it will be shown that Böhm-Bawerk's dual conceptions of capital are actually the products of Aristotelian non-precisive abstraction and as such are imbued with the spirit of Aristotelian realism.

Böhm-Bawerk's Conceptions of Capital

Böhm-Bawerk's dual conceptions of capital are fully elaborated in the second volume of his book series on capital and interest, *The Positive Theory of Capital*. Böhm-Bawerk first begins with an introduction of the most widely accepted, old conception of capital, which refers to physical tools serving both as a factor of production *and* a source of interest:

> In systems of Political Economy, the word Capital and the theory of Capital are regularly met with in two distinct spheres; first, under Production, and, second, under Distribution. In the former case capital is represented as a factor or tool of production...In the latter case capital appears as...the source of Interest.
> (Böhm-Bawerk 1891 [1930], 1)

[10] Aquinas too makes the same point: "the intellect is said to be false when it understands a thing otherwise than as it is, that is so, if the word 'otherwise' refers to the thing understood; for the intellect is false when it understands a thing otherwise than as it is; and so the intellect would be false if it abstracted the species of a stone from its matter in such a way as to regard the species as not existing in matter, as Plato held. But it is not so, if the word 'otherwise' be taken as referring to the one who understands. For it is quite true that the mode of understanding, in one who understands, is not the same as the mode of a thing in existing" (Summa Theologiæ I. 85. 1 ad 1).

For Böhm-Bawerk, however, it is this conception of capital that should be responsible for the fallacious naïve productivity theory of interest, which understands capitalist interest as due to the higher physical productivity resulted from using tools in production.[11] It seems, or so the argument goes, that a conception of capital specifying both the tools *and* the interest-bearing quality of such tools would easily mislead people to the conclusion that interest is not a value phenomenon irreducible to physical productivity, thereby causing a confusion of the sphere of material production with the sphere of distribution or exchange, the latter being ultimately grounded upon people's subjective valuations (Böhm-Bawerk 1891 [1930], 1).

Since there is a real distinction between tools as a physical factor of production and a source of surplus value or interest, naturally, Böhm-Bawerk seeks to make a theoretical division of "the theory of Capital as a Tool of Production" and "the theory of Interest" (Böhm-Bawerk 1891 [1930], 3). The old conception of capital appears to be unqualified as a suitable subject for both theories, and new subjects, namely, social capital and acquisitive (private) capital, are needed respectively:

> Capital in general we shall call a group of Products which serve as means to the Acquisition of Goods. Under this general conception we shall put that of Social Capital as narrower conception. Social Capital we shall call a group of products, which serve as means to the socio-economical Acquisition of Goods; or, as this acquisition is only possible through production, we shall call it a group of products destined to serve towards further production; or, briefly, a group of Intermediate Products. Synonymous with the wider of the two conceptions, the term Acquisitive Capital may be very suitably used, or, less suitably but more in accordance with usage the term Private Capital.
> (Böhm-Bawerk 1891 [1930], 38)

The following discussions will clarify the view of abstraction upon which Böhm-Bawerk's conceptions of social capital and acquisitive capital are grounded. To better clarify the philosophical root of Böhm-Bawerk's dual conceptions, John Hicks's demarcation between *fundism* and *materialism* in capital theories will be introduced:

[11] The fallacy of the naïve productivity theory of interest can be phrased as follows: "the physical productivity of the tractor explains why more crops can be harvested with it than without. But the tractor's physical productivity does not (by itself) explain why the value placed on the tractor (i.e. its price of $8,000) should be lower than the value placed on its future products (i.e. the marginal revenue of $10,000)" (Murphy 2003, 1–2). As Böhm-Bawerk carefully explains (1890, 138–140), if the naïve productivity theory of interest were correct, then there would be every reason to believe that market competition would bring the value of a tractor up to the point that equals the value of those additional products acquired from using the tractor. But then there would be no such thing as capitalist interest: interest is the *surplus value* between the marginal value products of the tractor and the value of the tractor.

> But what is Real Capital? We cannot say that the two measures are two measures of the same thing...If it is capital in the volume sense that is being measured, capital is physical goods; but in the value sense capital is not physical goods. It is a sum of values which may conveniently be described as a Fund...There are some for whom Real Capital is a Fund I shall call them Fundists; and there are some for whom it consists of physical goods. It is tempting to call the latter Realists; but since one wants to emphasize that both concepts are real, this is not satisfactory. I shall venture in this paper to call them Materialists. (Materialists, I mean in the sense of Dr. Johnson's refutation of Berkeley's idealism—"striking his foot with mighty force against a large stone, till he rebounded from it, I refute it thus.")
> (Hicks 1974, 309)

According to Hicks, it is out of the question for materialists and fundists whether there is really such a thing as capital. The point of departure is to be found in their respective real definitions of capital: materialists in capital theories define capital as a volume of physical goods, *exclusive of values*; fundists define capital as a sum of values, *exclusive of physical goods.*

For the argumentative purpose, it is optimal to begin with the conception of acquisitive capital—a conception that is of "a pre-eminent importance for the theory of income as being the source of interest" (Böhm-Bawerk 1891 [1930], 38). Is the conception of acquisitive capital materialist or fundist? The answer is decidedly negative. It does not refer to a volume of pure physical goods devoid of values. Nor does it refer to a sum of pure values without accompany of physical goods. Rather, it refers to a group of produced economic goods[12] serving for individual persons' acquisition of interest or, in short, refers to *interest-bearing physical products*, which presupposes the existence of exchange value or market prices of those products. The conception of acquisitive capital transcends the fundist/materialist antithesis, for it does not take the two distinct defining characteristics of capital to be ontologically separable from each other.[13]

One can further distinguish acquisitive capital into three different kinds. Apart from the interest-bearing *tools of production*, there are also *durable consumption goods* employed not for consumption but for renting, the total market value or prices of their uses or services, like the case of interest-bearing tools of production, exceed the market value or prices paid for their ownership by individual capitalists (Böhm-Bawerk 1891 [1930], 71). And *interest-bearing money*: "the development of the scientific concept of capital starts from the notion of an interest-bearing sum of money" (Mises [1952] 2009, 88).

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[12] By implication, "products" rule out the two *original* factors of production: labor and land.

[13] "For an Aristotelian what is distinct is not necessarily separable" (Rasmussen and Den Uyl 1991, 39).

Then it comes to the conception of social capital. Since the conception of social capital specifies only the physical tools of production or intermediate products, it is easy to jump to the conclusion that Böhm-Bawerk is a materialist insofar as his conception of social capital is concerned.

Or is it really the case? Since materialists seek to define capital as purely physical tools of production, *the issue naturally depends on whether Böhm-Bawerk also intends his conception of social capital as a real definition of capital*. To find out the answer, consider the following citations. The first citation is excerpted from Böhm-Bawerk's comments on Adam Smith's demarcation between *national* and *individual* capital, which is the prototype of his own conceptions.[14] The second citation comes from his defense of the dual conceptions of social and acquisitive capital. The third citation justifies his replacement of Smith's original conception of national capital by the new conception of social capital:

> [i]n National Capital the characteristic of being the national source of interest came to the front only for a moment, but this moment was long enough to attach the name of "capital" to it. Scarcely was this done when the centre of gravity was shifted, and placed in its relation to production, and since then National Capital has been looked on as an independent conception, substantially quite foreign to its namesake, Private Capital.
> (Böhm-Bawerk 1891 [1930], 28)

> [i]t is not necessary…to make two conceptions of capital that are entirely foreign to one another, and have nothing more in common than cat has with category. Our two conceptions have just enough in common to allow of their being formally coupled under one common definition, and then distinguished as narrower and wider conceptions.
> (Böhm-Bawerk 1891 [1930], 40)

> I use the phrase Social Capital, and not the common expression National Capital. I do so for this reason, that, for a limited community, the means of acquisition embrace not only productive goods but consumption goods lent to foreign countries. Those who hold by the conception of National Capital, then, must either take in the above-named consumption goods along with productive goods, thereby arriving at a very uninteresting conception indeed; or if they mean to confine it to productive goods only, they must build their national conception on a quite independent basis, and

[14] For a tribute to Smith's contributions, see Böhm-Bawerk (1891 [1930], 26–29, 39).

> break off all logical connection with the other conception, —which would at any rate be a doubtful policy. Our "Social Capital" avoids both these difficulties.
> (Böhm-Bawerk 1891 [1930], 40–41)

The above citations, though of no substantive economic importances, actually amount to a detailed description of how the conception of social capital is finally arrived at through abstraction of real things. The whole intellectual procedure can be rephrased in the following manner. First, discover from reality various interest-bearing products, and abstract from those individual things the conception of acquisitive capital; then, narrow down one's thoughts to one particular species of acquisitive capital, viz., interest-bearing intermediate products; and finally, narrow down one's thoughts to physical tools of production. During this thought process, first the interest-bearing durable final consumption goods (and interest-bearing money), then the interest-bearing quality of tools of production, are ignored one by one.

It may be doubted whether this thought process should really be considered as Aristotelian selective attention instead of Platonic paring away. However, for Böhm-Bawerk, interest-bearing quality is a formal part of the essence of capital. By paring away the interest-bearing quality of one kind of capital (viz., interest-bearing intermediate products), what is left is purely physical intermediate products. *But purely physical intermediate products simply cannot be capital.* To state the otherwise is tantamount to say that Socrates' physical body is Socrates. A term "social capital" might be attributed to those physical items, still it has nothing to do with capital *as it is in reality*. To paraphrase Böhm-Bawerk, it is a conception which breaks off all the logical connection with (the conception that refers to) real capital.

It cannot be emphasized too strongly that for Böhm-Bawerk, the conception of social capital is required only because there is an intellectual need to give an independent thought on the specific function of capital in time-consuming, roundabout process of material production (Böhm-Bawerk 1891 [1930], 38). And it is no part of his intention to understand capital *to be* otherwise than it really is. Only Aristotelian non-precisive abstraction can produce a conception which *signifies but does not specify the interest-bearing quality of (a kind of) capital.*[15]

[15] As Gordon (1996 [2020]) points out, the central view of Böhm-Bawerk is that "concepts needed to be traced to their origins in perception, their ultimate source... an analyst in the tradition of Böhm-Bawerk would ask: where does this notion come from? Can one show how it might be arrived at through abstraction from experience...Concepts that do not refer to something perceptible must be derived from concepts of perceptible things." Without textual evidences, Gordon further credits the medieval philosopher William Occam as the philosophical inspiration of Böhm-Bawerk. There is however no evidence to show that Böhm-Bawerk takes from Occam his nominalism—a view which postulates essences as individuals rather than universals.

Böhm-Bawerk's extended discussions about acquisitive and social capital, however deficient they might be from the economic point of view,[16] do not concern us here. **Table 1** summarizes and compares Böhm-Bawerk's dual conceptions and the old conception of capital:

Conceptions of capital	Intended real things	Specified aspects of real things
Acquisitive capital	Interest-bearing products	Physical and value aspects
Capital (in the widely accepted old sense)	Interest-bearing intermediate products	Physical and value aspects
Social capital	Interest-bearing intermediate products	Physical aspect

Table 1: Comparison of Böhm-Bawerk's dual conceptions and the old conception of capital.

Is Böhm-Bawerk a Materialist in Capital Theories? Rejoinder to Criticisms

It is now suitable to address some notable criticisms from Böhm-Bawerk's predecessors, contemporaries, as well as his followers. Despite the subtlety of these objections, they share the misbelief that Böhm-Bawerk is a leading proponent of materialism in capital theories: either it is held that Böhm-Bawerk has only a materialist conception of capital, or that Böhm-Bawerk's specific conception of social capital is materialist. Defending Böhm-Bawerk against these criticisms would help to substantiate the above Aristotelian realist readings of his dual conceptions.

First there is the famous quibble from Carl Menger that "The time will come when people will realize that Böhm-Bawerk's theory is one of the greatest errors ever committed" (Schumpeter 1966, 814). If Lewin and Cachanosky (2019, 42) is correct that Menger's quibble arises from his consideration of it being "necessary to stick with common terminology where capital relates to sums of money dedicated to the acquisition of income", then Menger's quibble, despite its fame in the history of economic thought, appears to be nothing more than a mere quibble.[17]

There is next the objection from Frank Fetter ([1900] 1977, 33–73). Fetter believes that a correct conception of capital must have a regard to value: "In the concept of capital must be united both the thought of concrete things and that of their value,

[16] See Böhm-Bawerk (1891 [1930], 65–66, 71). To note just two points: first, he falsely claims that money falls under the conception of social capital (Mises [1952] 2009, 90). Second, the classification of means of subsistence as acquisitive capital is extremely unconvincing.

[17] It should be pointed out that this is not the only available interpretation of Böhm-Bawerk's "greatest error". Garrison (1990) suggests that the "greatest error" is to be found in the mathematical formalism which underlies his theory of the market rate of interest.

for their quantity is only measurable in a way that permits of comparison in terms of value"; "Capital is economic wealth whose quantity is expressed in a general value unit" (Fetter [1900] 1977, 66, 68). Fetter then criticizes Böhm-Bawerk for unduly omitting the value aspect of capital.

Leaving aside other technical problems of Fetter's criticisms,[18] only a serious misunderstanding of Böhm-Bawerk would lead one to conclude that the conception of acquisitive capital constitutes a denial of Fetter's above conclusions. Fetter further asserts that Böhm-Bawerk's conception of social capital is materialist and the conception of acquisitive capital is fundist: "he has not one, but two concepts of capital… while defining capital as if it could be spoken of without reference to value or the use of value expressions, he employs a value concept almost entirely in his reasoning on the interest problem" (Fetter [1900] 1977, 65–66). True, capital cannot be spoken of without reference to value or the use of value expressions, if what is meant here is that the conceptions of capital must have intention or reference to capital existing in reality—which simply cannot be what it is save as interest-bearing products. However, *capital can definitely be spoken of without reference to value or the use of value expressions*, in the sense that *capital can be abstractly thought of without having to consider at the same time its value aspect.* This, and nothing else, is what Böhm-Bawerk does as he conjures up the conception of social capital.[19]

Finally, there is Ludwig von Mises, who later abandons Böhm-Bawerk's dual conceptions under the influence of Fetter and Clark. Elaborating upon Fetter's emphasis of the value aspect of capital, Mises proposes a financial or accounting view of capital—that is, the concept capital is seen as a mental counterpart of human beings' profit-loss calculation (Mises [1949] 1995, 260–264, 476–520; Akatsuka 2019). In a socialist society where profit-loss calculation is impossible, the concept capital also losses its meaning:

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[18] Fetter's criticisms ([1900] 1977, 49–57) are based first and foremost upon a confusing distinction between "economic interest" and "contract interest", which in turn is grounded upon the false assertion that "The economist's problem in distribution is essentially an impersonal one, to determine the economic contribution regardless of the question of legal ownership" (Fetter [1900] 1977, 52–53). Contrary to Fetter's claims, the economic problem of distribution or exchange of economic goods is also the legal problem of transference of ownerships or titles to economic goods (Rothbard [1982] 2002, 35–43, 133–148), and it is not the so-called "economic interest", but contract interest earned by businessmen and capitalists, that is the subject matter of the theory of interest. Second, the definition of income as "a series or group of satisfactions, *not as a series or group of material things*" (Fetter [1900] 1977, 53, italics added) is problematic insofar as it may suggest that real human beings can, to quote William Sumner (1882, 255), "eat their intentions, wear their hopes, and be warmed by their promises." Fetter provides the example of a daydreamer's "ephemeral forms of wealth" (Fetter [1900] 1977, 54). The example, however, is incompatible with Menger's theory of goods and wealth (Menger [1871] 2007, 51–113), as Menger's theory neither implies that one's desires can be satisfied by merely *thinking about* them, nor implies that goods and wealth are not things existing outside of the mentality of human beings.

[19] It will become clear later that Fetter's charge actually applies to Clark's dual conceptions of capital goods and true capital.

> Capital is a praxeological concept…It is a product of reasoning, and its place is in the human mind. It is a mode of looking at the problems of acting, a method of appraising them from the point of view of a definite plan. It determines the course of human action and is, in this sense only, a real factor. It is inescapably linked with capitalism, the market economy. It is a mere shadow in economic systems in which there is no market exchange and no money prices of goods of all orders. The capital concept is operative as far as men in their actions let themselves be guided by capital accounting.
> (Mises [1949] 1995, 512)

It is hard to see how this view of capital constitutes a radical opposition to Böhm-Bawerk's conception of acquisitive capital. No such thing as capital can ever exist if market exchange and exchange value/money prices of goods of all orders do not exist. This is the natural conclusion drawn from the real definition of capital that it is interest-bearing products. Mises may be credited for making explicit and developing further a view which before was only implicit in Böhm-Bawerk's conception of acquisitive capital, but it is a different matter to argue that this conception does not at least acknowledge or imply a financial or accounting view.[20]

Mises's criticisms of the conception of social capital (Mises [1949] 1995, 264, 518) run in parallel with his financial or accounting view of capital. The conception of social capital, Mises argues, is the by-product of thinking about a socialist society wherein no money prices for both the original and produced factors of production can ever exist. By thinking about such a society, "One discovers a momentous difference between capital as seen from the individual's point of view and as seen from the standpoint of society", but "this whole reasoning is utterly fallacious" since a capital concept having no regard whatsoever to the value aspect of (produced) factors of production is simply not a qualified capital concept (Mises [1949] 1995, 518).

Mises seems to be misled by Böhm-Bawerk's puzzling statements in *The Positive Theory of Capital*.[21] A shift from an individual point of view of capital to a social point of

[20] To stress like Mises that capital is "a praxeological concept", a "product of reasoning", and "its place is in the human mind" can be somewhat misleading. Admitting that the concept capital is a mental counterpart of economic calculation, the issue however is not just about *the mental process* of economic calculation, but calculation *of what*. Profit-loss calculation must, as correctly recognized by Mises, utilize real money prices, otherwise the so-called calculation would end up as nothing more than a Wittgensteinian linguistic game without intentionality. However, no such things as money prices can ever exist save as money prices *of concrete physical products*. No wonder even Mises has to admit that his mental tool for economic calculation must in the end have reference to concrete physical products, see Mises ([1949] 1995, 500): "Capital is always in the form of definite capital goods."

[21] Böhm-Bawerk (1891 [1930], 40, italics added): "True, their connection is not an intimate one, and in the light of what has been said it cannot be so; it rests simply on the accidental circumstance that, *for society as a whole, which cannot*

view may indeed, as described by Mises, amount to a mental process whereby *the value aspect of factors of production is specified as absent so that finally there arises an imaginary construction of socialist society*. A more plausible interpretation, however, would suggest that Böhm-Bawerk here is merely engaging in Aristotelian non-precisive abstraction, and a shift to a social point of view of capital simply marks that *the value aspect of (produced) factors of production now begins to be absent from the specification of one's thoughts*. Böhm-Bawerk does not arrive at the conception of social capital by conjuring up a socialist society: he derives the conception of social capital from the parent conception of private or acquisitive capital.

Later Austrian economists, despite their subtle disagreements on capital theories, visibly take in common a materialist interpretation of Böhm-Bawerk's theory (Endres and Harper 2011; Braun 2015, 2020; Akatsuka 2019). Such interpretation can be briefly summarized as follows: "For Böhm-Bawerk, capital is but a different word for 'tools and weapons'" (Braun 2020). It has been shown carefully why capital is for Böhm-Bawerk *not* synonymous with tools and weapons. A final testimony to the refutation of a materialist interpretation should come from nobody else but Böhm-Bawerk himself:

> I, too, believe that capital is a "fund" or "quantum" of matter. I think it clear that any one who wishes to make an estimate of the size of this fund must measure it, not by counting the pieces or calculating their volume or weight, but by measuring it in terms of value—nowadays in terms of money.
> (Böhm-Bawerk 1906, 5)

Clark's Conceptions of Capital

This section aims at an elucidation of Clark's dual conceptions of capital. Like Böhm-Bawerk, Clark too is frustrated by the fact that the widely accepted, old conception of capital entails two apparently distinct theoretical problems; one falls within the sphere of production while another falls within the sphere of distribution or exchange (Clark 1899, 122–123). Contrary to Böhm-Bawerk, whose proposed modification is a subtle one that requires detailed clarifications, the modification proposed by Clark is very simple and straightforward: he argues for a sharp dichotomy between *capital goods* and *true capital*.

In Clark's theory, the conception of capital goods is strictly confined to concrete physical intermediate products, which are "perishable", "not perfectly mobile", "have

acquire except through producing, the goods which constitute the produced means of acquisition (capital in the wider sense) coincide with the goods which constitute the produced means of production (capital in the narrower sense, or Social Capital)."

periods of production" (Clark 1894; 1899, 117–118; Cohen 2008). On the other hand, the conception of true capital is strictly limited to what he calls a value fund denominated in terms of money, which is, in a strict dichotomic manner, "permanent", "perfectly mobile", "has no periods" (Clark 1894; 1899, 117–120, 128; Cohen 2008). For Clark, *capital goods and true capital are two substantially different real entities existing out there and* in their own right *for economic studies*:

> Beyond dispute it is the duty of the economist to describe facts as they exist...My claim is that a certain objective thing to which the name "capital" may be rightly applied, and that something also exists to which the name "capital goods," may be properly applied; that these two entities, which at first glance may seem to be identical, are, on a second glance, found differing in an important part that both of them are essential parts of an economic theory, but that one cannot in such a theory be freely substituted for the other without producing very serious confusion.
> (Clark 1907, 352)

Concrete capital goods function as the ever-changing "containers" or "forms of embodiment" for the immaterial, permanent value fund: "concrete things will figure in his thoughts as the containers of his capital; while the content itself will appear to him to be a value, an abstract quantum of wealth" (Clark 1888, 9–10).[22]

Clark's formulations allow no space for misrepresentation: it is Platonic, precisive abstraction that is involved as he derives from real interest-bearing intermediate products the dichotomic conceptions of capital goods and true capital. The physical aspect is pared away from interest-bearing intermediate products in order to get an immaterial value fund or quantum, and that which is cut off from interest-bearing intermediate products becomes purely physical intermediate products. The originally distinct but inseparable aspects of capital are thus taken to be ontologically separable from each other and become two separated existences.

Böhm-Bawerk has already shrewdly realized the platonic characteristic of Clark's whole thought process:[23]

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[22] Clark (1894, 66) further develops a waterfall analogy to illustrate the relationship between capital goods and true capital.

[23] Interestingly, Karl Marx's proof of labor as the principle of exchange value offers another example of platonic way of abstraction in economic theorization. Marx's proof (Marx 1909, 43–45; Böhm-Bawerk 1890, 367–370, 381) can be briefly summarized as follows: 1) any exchange ratios between any commodities bear the form of a = b; 2) in order for a = b, there must be something within a and b that is common to both; 3) this third element, common to both a and b, cannot be the use value of commodities, for commodities are of different use values; 4) after abstracting from/paring away the use value of commodities, the common property left which maintains the equivalent relation between commodities in exchange is "human labour in the abstract."

> Clark thinks of capital as a quantum of value "imputed" in material goods. He strips off everything which may suggest material existence, and retains only a value jelly, existing eternally, never destroyed, which is the true twin of Marx's labor jelly. (Böhm-Bawerk 1907, 280)

The following quotation from Clark further shows that he uses abstraction in Platonic rather than Aristotelian way, leading both to a reification of the conception of true capital in reality and to a relegation of concrete intermediate products into nothing more than mere receptacles of this reified value jelly:

> A value, a quantum of wealth, or a fund—if one of these be thought of apart from the concrete things that embody it, it is an abstraction; but if it be thought of as actually embodied in concrete things, it is not an abstraction, but a material entity. (Clark 1899, 119)

Clark's True Capital: Illuminating the Reality or Distorting the Reality?

It has been shown that Clark's dual conceptions are actually the products of Platonic precisive abstraction. Now, for Clark, it is true capital that is the proper subject of capital and interest theories (Clark 1899, xviii, 116–141, 303–319; Tanaka 2000, 131). This section will focus on Clark's analyses of material production and capitalist interest, and show how his reasonings are affected by the conception of true capital.

With regard to interest, Clark asserts that 1) rent is the earnings of capital goods; 2) interest is the earnings of true capital; 3) total interest equals total rent, and the latter is fundamentally subject to the former (Clark 1899, 123–124, 135). What accounts for the existence of interest? Clark argues that interest arises from the marginal productivity of true capital (Clark 1899, 135; Cohen 2008). In the same manner as wage payments to labor are subject to the law of diminishing marginal productivity and fall as the quantity of labor increases, interest payments to true capital are subject to the law of diminishing marginal productivity and fall as the size of true capital expands.[24]

As for capital-using physical production, Clark argues that, although capital goods do have time periods, real production structure does not have time periods, because the immaterial and permanent true capital has a spillover effect over its physical embodiments, which *synchronizes* the whole production structure: "Capital goods interpose periods between labor and the culling of its fruits. True capital annihilates those intervals, and makes the reward of labor to come immediately" (Clark 1894, 66);

[24] For a graphic representation of Clark's marginal productivity theory of distribution, see Brue and Grant (2012, 281–284).

“capital makes the work and the ripening of its virtual product synchronous” (Clark 1899, 132). Moreover, as a direct result of synchronization, the maintenance of capital goods in production becomes automatic and does not at all involve saving, viz., abstention from consumption: “The maintenance of it, the mere renewal of the wasting tissue of it, does not require abstinence”; “the keeping up of the series of capital-goods is, in a sense, automatic. The mill, the ship, etc., virtually replace themselves as they are worn out; and these facts signify that, in a static condition, capital-goods would be created forever in limitless variety and number, but that no capital would be created” (Clark 1899, 130–134).

In short, Clark concludes from his study of true capital that interest is irrelevant with time, and real production structure does not have time periods and has little to do with saving.[25] Both conclusions are false, however.[26] The latter conclusion particularly stands in sharp opposition to Böhm-Bawerk’s theory of social capital (Böhm-Bawerk 1891 [1930], 5–125), which argues that 1) material production is a time-consuming and roundabout process, and 2) the maintenance of social capital also requires saving.

The falsehood of Clark’s second conclusion is best illustrated by Böhm-Bawerk’s theoretical follower, Frank William Taussig. To clarify the point, Taussig first introduces a graphic representation of the time structure of production (Taussig 1896, 23–25):[27]

Taking randomly a time series, for example from 1890 to 1894. $A_{1\ldots4}$ represent the highest stage of production in which original factors of production transform into

In 1890....................	A	B	C	D	E
“ 1891....................	A_1	B_1	C_1	D_1	E_1
“ 1892.................. ..	A_2	B_2	C_2	D_2	E_2
“ 1893..	A_3	B_3	C_3	D_3	E_3
“ 1894........	A_4	B_4	C_4	D_4	E_4

Figure 1: Taussig’s graph of the time structure of production.

[25] For Clark, saving is only required for the *genesis* of new true capital and their physical embodiments (Clark 1899, 133–134).

[26] Almost all modern theories of interest believe that interest cannot be correctly explained by omitting time-preference (despite subtle disagreements on what time-preference really means).

[27] Taussig’s graph is a visual representation of what he calls *the successive division of labor* (Taussig 1896, 4–6). It is constructed by selectively attending to the physical course of successive division of labor while ignoring temporarily its natural corollary, viz., market exchange: “Commonly, however, the division of labor has brought with it as a natural corollary the exchange of the several commodities produced by different worker” (Taussig 1939, volume 1, 36). As such, Taussig’s graph is also a product of Aristotelian non-precisive abstraction.

products in the first place, and $E_{1...4}$ represent the lowest stage of production in which final consumption goods come into maturity. As such, A ($A_{1...4}$), B ($B_{1...4}$), C ($C_{1...4}$), D ($D_{1...4}$), E ($E_{1...4}$) represent the *successive stages of production* through which original factors must pass until the final maturation of consumption goods. Each capital letter also represents outputs of different stages[28] and/or the labor inputs required for making outputs in respective stages.

Clark would claim that the input of labor in A_4 contributes directly to fruition of final consumption goods in E_4 (Taussig 1908, 338). In fact, however, the input of labor in A_4 contributes to fruition of final consumption goods *5 years later*, and for the fruition of final consumption goods in E_4, labor must be inputted *5 years before* in A. As Taussig carefully explains:

> [t]he workers E_4 cannot be completing the material which A_4 are bringing forth at the same time...E_4 must be at work on products which came from D of an earlier period, say the D_3 of 1893; D_3 got them, partly advanced toward completion, from C_2 of 1892; the first steps were taken five years ago by A_1 of 1890. The diagonal line marks the labor which yields the enjoyable commodities of 1895—labor mainly of the past, and only in small part of the present.
> (Taussig 1896, 24)

Therefore, "There is not, in fact, any 'synchronizing' of production or any 'instantaneous' clothing of the people" (Taussig 1908, 339). At each current time period it is found that laborers are working concurrently in successive stages of production for outputs of different orders, but this fact constitutes no objection to the fact that material production is itself a time-consuming process.

With regard to the corollary claim that no saving is involved in the maintenance of social capital, Taussig argues that, abstinence or waiting is to be found in the fact that, an overwhelmingly great proportion of laborers of the society, rather than just lying idle or giving finishing touches to maturation of consumption goods in E_4 so that the same amount of consumption goods can be produced with only one-fifth of the labor time per head,[29] is diverted toward stages A_4, B_4, C_4, D_4 for outputs of higher orders:

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28 Although these outputs constitute the total stocks of wealth disposable by the society, only that part of the total stocks of wealth of the society, represented by E (E1...4), constitutes the flows or streams of real income of the society as a whole. See Taussig (1896, 48).

29 To be precisely, the number in Taussig's original discussion (1908, 339–340) is one-quarter. This is because he supposes four rather than five stages of production as we do in the present paper.

> The group as a whole, in other words, has its choice: it may either enjoy once for all on easy terms in the present or it may continue to work in the present, and so maintain the machinery of production for sustained enjoyment through the future. This is precisely what "abstinence" or "wait" must mean...There is, then, a choice be idleness (or play) and work which provides for the future. That choice recurrently presents itself as tools wear out and materials are used up.
> (Taussig 1908, 340)

The maintenance of social capital is not automatic or self-perpetuating. It is merely *selected* by human beings who have made the judgement that, as compared to the enjoyment of immediate want-satisfactions, it is more important to sacrifice immediate want-satisfactions so that provisions for future want-satisfactions can be made possible. The sacrifice underlying the maintenance of social capital does not cease to be a sacrifice simply because it has been continuously selected for a long time and has already become a habituation, and the sacrifice in no way falls short of the outcome of the exercise of human beings' freedom of choice simply because in the foreseeable future the selection of immediate enjoyments will not be substantiated whenever social capital is used up.[30]

What prevents Clark from realizing the time-consuming nature of real production structure and the role of saving in maintenance of social capital? Cohen (2008) suggests that the reason is to be found in the methodological use of static equilibrium and comparative statics as effected by his conception of true capital. That is, the failure of Clark is ultimately the failure of statics to yield those time-related characteristics of real production structure. Cohen's claim notwithstanding, it appears to be more plausible to argue that Clark's falsehood is due to the fact that *the conception of true capital is the product of Platonic, precisive abstraction, which* leads him to understand *material production and capitalist interest to be otherwise than what they are in reality*. What should be criticized thus is not simply the use of statics in economic analysis,[31] but rather that type of philosophical abstraction upon which Clark's methodological defense of static equilibrium and comparative statics is ultimately grounded. In the following paragraphs, Clark defends what he calls the "the essential realism of a static theory":

> The description of the purely static state, in fact, deals with realities. It is imaginary only by its omissions; for it presents an essential part of the forces that act in

30 That the replacement of social capital is not automatically done holds true even if one starts from the conception of acquisitive capital and takes into account the value aspect of intermediate products, see Taussig (1908, 342–343).

31 As Mises ([1949] 1995, 246–247) shows in his discussions of the imaginary construction of the final state of rest, static equilibrium and comparative statics are perfectly justified in studying factors for real price changes. The use of statics thus is not, as Cohen's article suggests, radically incompatible with a realistic analysis of the economy.

> the real, dynamic world... The static system of groups and sub-groups should, then, be thought of as an ideal arrangement, projecting itself through the disturbed and changing group system of actual society just as the imaginary level surface of the sea projects itself through the waves. We need, above all things, to see the static society as it is... it is a shape and a mode of action that the real world carries within it... What we have to see is how static laws operate in a dynamic state.
> (Clark 1899, 401–403)

For Clark, the static system is *not* an auxiliary mental device for studying real dynamic world. *It is itself a reality, hiding beneath and projecting itself through the observable changes of the world.* Only through omissions, viz., paring away, of real changes could this stationary state be revealed. And this static system, as a subject of economic science, is itself the starting point from which all the empirical laws governing such a state are to be deduced. Clark's use of statics thus stands in sharp contrast to Aristotelian-Austrian economist Murry Rothbard, for whom "false assumptions are useful in economic theory, but only when they are used as auxiliary constructs, not as premises from which empirical theories can be deduced" (Rothbard 1957). The "essential realism" of Clark's static equilibrium is Platonic, not Aristotelian.[32]

Lesson from the Böhm-Bawerk/Clark Controversy

Böhm-Bawerk's dual conceptions of capital provide solid grounds for studying the reality of the economy by virtue of their common philosophical root in Aristotelian non-precisive abstraction. The conception of acquisitive capital is well in line with a financial or accounting view, and as such is able to provide a lively ground for future

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32 The reviewer asks whether Clark's methodological defense of static equilibrium and comparative statics could be seen as pragmatic or instrumentalist. The reason why Clark himself cannot be taken as a pragmatist is to be found in the fact that, Clark sees his theory as offering *empirical laws of facts*, rather than *analytical laws that confers verifiability to future possible experiences*. A conceptual pragmatist would claim something like this: *in the Clarkian universe* capitalist interest is paid according to diminishing marginal productivity and material production is synchronized; nevertheless, scientific evidences one day will show *whether our universe is a Clarkian universe* (such a view may be referred to as the "predicate view of models," cf., Hausman, *The philosophy of Economics*, 11; but the view actually has its articulation in C. I. Lewis's "pragmatic conception of the a priori." For further expositions of Lewis's view, see Veatch, *Two Logics*, 101–102, 136. Clark, by contrast, claims that by studying the objective entity true capital, one discovers real forces governing the production and the distribution of income of society, real forces which reassert themselves in the economy regardless of whatever dynamic changes that may occur. One needs only to consult Clark (1899, v), as well as his example of cutting and planting trees (1899, 131–132; Braun 2014, 102–105). For Clark, cutting and planting trees simply offers a factual example of synchronization of production. It would be farfetched to say that Clark argues on the one hand an analytical law "material production is synchronized," and on the other hand uses the example of cutting and planting trees to verify or falsify the empirical statement "there is material production."

It is not to deny that there is indeed a pragmatist/instrumentalist Clark, who lives only in later positivist economists' rational reconstruction of the past. See note 35.

developments of a theory of capital which takes into account the central role which capitalist-entrepreneurs play in the dynamics of market economy.[33] The conception of social capital, on the other hand, establishes truisms about material production which are often forgotten, trivialized, or even outwardly rejected in learned and unlearned discussions.[34] By contrast, Clark's theory, appearing at the first sight to be a mythology of static equilibrium, represents actually a mythology of Platonic precisive abstraction.

The use of static equilibrium and comparative statics in economics must be consonant with Aristotelian non-precisive abstraction. Such a lesson, however, is valid only for those who share with Böhm-Bawerk and Clark the belief that the aim of economics is to illuminate the truths of reality so that the reality can become more and more intelligible. Not all economists share the same concern for truth criterion in judging the soundness of economic theories. The methodological instrumentalism of the mainstream economics, pioneered by Milton Friedman (1953), openly proposes in place of *intelligibility* the criterion of *predictability* for economic theories. The lesson thus ceases to be a lesson since the use of statics is simply rationalized by giving up the resort to truth criterion and intelligibility of reality at all. And the empiricist anti-essentialism has its full-fledged application in the field of economics as abstraction underlying the methodological instrumentalism no longer represents a conformity of mind to the ways things are and essentially are. The result is that, despite the criticisms of Böhm-Bawerk, Clark's true capital subsists in the form of such simplified formal model as "Surrogate Production Function."[35]

Further addressment of the methodological instrumentalism of the mainstream economics and the type of abstraction with which it is working is beyond the scope of the present paper.[36] What the present paper does offer, however, is a ground for appreciating the type of abstraction which is consonant with the intellectual thrust to study the reality of human beings' economic lives. In contrast to the mainstream economics, the Austrian school of economics takes a causal-realist approach to analysis and has its methodological apriorism rooted firmly in Aristotelian realism (Klein 2008; Salerno 2009; Smith 1990, 1994; Gordon [1996] 2020). Recent researches (Long 2006;

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[33] See Lewin and Cachanosky (2019) for hints about further elaborations of the Menger-Fetter-Mises financial approach to capital.

[34] The notion of period of production is rejected by Clark and Frank Knight; trivialized by John Maynard Keynes (Garrison 1990).

[35] See Samuelson (1962, 194, italics added): "What I propose to do here is to show that a new concept, the 'Surrogate Production Function,' can provide some rationalization for the validity of the simple J.B. Clark parables…I shall…show how we can sometimes *predict* exactly how certain quite complicated heterogeneous capital models will behave by treating them as if they had come from a simple generating production function."

[36] See Caldwell (1980) and Long (2006) for detailed critiques.

Rasmussen 2020) further stress the central role which Aristotelian non-precisive abstraction plays in the Austrian school's methodological apriorism. The lesson drawn from the first capital controversy thus can be fully appreciated only by situating the present paper into the broader context within which Aristotelian-Austrian apriorism is defended against the positivism which dominates modern economics.

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